

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection**

B663673066

FACILITY: Consumers Energy - Ray Compressor Station		SRN / ID: B6636
LOCATION: 69333 OMO RD., ARMADA		DISTRICT: Warren
CITY: ARMADA		COUNTY: MACOMB
CONTACT: Amy D. Kapuga , Principal Environmental Engineer		ACTIVITY DATE: 08/08/2024
STAFF: Noshin Khan	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: scheduled on-site inspection		
RESOLVED COMPLAINTS:		

On Thursday, August 8, 2024, I, Noshin Khan, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff, performed a scheduled, on-site inspection of Consumers Energy Company – Ray Compressor Station located at 69333 Omo Road, Armada, Michigan 48005 (SRN: B6636). The purpose of the inspection was to determine the facility's compliance status with the requirements of the federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (Act 451); the AQD administrative rules, and the conditions of Renewable Operating Permit (ROP) Number MI-ROP-B6636-2020b.

I arrived at the facility at 9AM and met with Consumers staff Tom Fox, Field Environmental Coordinator and Andria Mitchell, Field Leader, to discuss the facility's operations. Ray Compressor Station is a natural gas storage and transmission facility. Natural gas is processed through emissions units including reciprocating internal combustion engines (RICE), turbines, boilers, and heaters. Natural gas is injected underground (compressed) between April and November and withdrawn for distribution between November and March. During my inspection, the facility was performing compression of gas in the storage fields. The operating hours for the station are 6:30AM-3:00PM, and 12 employees are assigned to the station.

Tom said no changes had occurred in the facility's processes since the last inspection in November 2022.

Below, I discuss compliance with permit conditions by emission unit (EU) and flexible group (FG) as organized in MI-ROP-B6636-2020b. The records I received from the company are available on the AQD shared drive at the following address: S:\Air Quality Division\STAFF\Noshin Khan\FY24\B6636 Consumers Ray.

EUDEHY3

According to the ROP description, this is a glycol dehydration system consisting of a natural gas-fired reboiler, still column, two contact towers, a surge tank, and a flash tank. This system processes natural gas drawn from the storage field to remove moisture from the gas.

I.1, I.2, VI.4: Emission limit Special Conditions (S.C.) I.1 and I.2 set VOC emission limits of 4.2 lb/hr and 18.2 tons per year (tpy) based on a 12-month rolling time period as determined at the end of each calendar month.

In accordance with S.C. VI.4, Amy Kapuga (Principal Environmental Engineer, Consumers Energy) provided VOC emission calculations determined using the GRI-GLYCalc software. These calculations include hourly emission rates, monthly emissions in tons, and 12-month rolling emissions in tpy. Amy confirmed that results from the most recent wet gas analysis are used as inputs in GRI-GLYCalc. According to the provided records, from November 2022 through July 2024, Plant 3 operated February through March of 2023 and March through April of 2024.

The highest hourly VOC emission rate during this period was 0.086 lb/hr as determined using GRI-GLYCalc for March 2023. The highest monthly VOC emissions were 0.0282 tons in March 2023. The highest 12-month rolling VOC emissions were 0.1040 tpy as calculated in November 2022, December 2022, and January 2023. The facility is in compliance with these conditions.

I.3, V.2: S.C. I.3 sets a NOx emission limit of 1.3 lb/hr. The AQD has not requested testing, per S.C. V.2, to verify the NOx emission rate from EUDEHY3.

I.4, VI.3, VI.4, VI.7: S.C. I.4 sets a benzene emission limit of less than 0.9 megagrams (Mg) per year based on a 12-month rolling time period as determined at the end of each calendar month.

Amy confirmed that the GRI-GLYCalc software (S.C. VI.3.a) is used to determine benzene emissions and provided monthly and 12-month rolling benzene emission calculations in accordance with VI.4 and VI.7.

The highest benzene emission rate in lb/hr for Plant 3 from November 2022 through July 2024 was 0.0056 lb/hr as determined using GRI-GLYCalc for March 2023 and the highest monthly emissions were 0.0018368 tons in the same month. The highest 12-month rolling benzene emissions were 0.0074 Mg/year as calculated in November 2022, December 2022, and January 2023. The 2024 wet gas analysis detected no benzene in the sample and 2024 emissions are consequently calculated as zero. The facility is in compliance with these conditions.

I.5, I.6, V.3: S.C. I.5 and I.6 set NOx and VOC emission limits of 0.098 lb/MMBTU and 0.0054 lb/MMBTU, respectively, for the reboiler associated with EUDEHY3. The AQD has not requested testing, per S.C. V.3, to verify the NOx and VOC emission rates from the reboiler.

III.1: During the pre-inspection meeting, Consumers staff told me that stripping gas is not used in EUDEHY3, in compliance with this condition.

III.2, IV.2, VI.2, VI.5: According to Consumers staff, the thermal oxidizer (TO) combustion chamber operates with a minimum retention time of 0.5 seconds as required by S.C. III.2. Per S.C. VI.2, the facility maintains a device that monitors the temperature in the combustion chamber of the TO on a continuous basis. I observed this monitor during my inspection, but there was no reading since the facility was not processing gas.

S.C. IV.2 defines satisfactory operation of the TO as having a minimum VOC destruction efficiency of 98% by weight, maintaining a minimum combustion chamber temperature of 1400°F, and maintaining a minimum retention time of 0.5 seconds. Amy provided a manufacturer operation and maintenance manual for the TO which indicates a destruction efficiency of 99.5%. During the inspection, staff provided me a copy of maintenance procedures for the TO that indicate that the thermocouple is calibrated annually and I reviewed the work order for the calibration performed in 2023. According to Consumers staff, an Ametek Sensor Test & Calibration Hot Box is used to do this calibration. These records indicate that the TO is maintained properly.

Amy provided the Plant 3 TO combustion chamber temperature records for periods of operation from November 2022 through July 2024 as required by S.C. VI.5. The 15-minute readings indicate that the unit operates above the 1400°F minimum set by S.C. III.2. I further discuss compliance with the minimum required operating temperature for the facility's thermal oxidizers in section FGDEHYHHH.

III.3: In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 glycol dehydration system. This plan includes equipment covered by the PM/MAP, operating variables to be monitored, malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP. The plan defines acceptable TO operating temperature range as 1400 to 1700°F, and parameters that are continuously recorded include combustion chamber temperature, fuel flow rate, and combustion air pressure. The monitoring system triggers an alarm or shutdown if readings for parameters are outside of acceptable range. The TO oxidizer operating temperature is checked daily and other weekly and monthly maintenance are performed as required. I reviewed work orders for inspection/maintenance done on EUDEHY3 in 2023. Based on the work orders and records reviewed and observations during the inspection, the facility is operating in accordance with its PM/MAP.

IV.1: During the pre-inspection meeting, Consumers staff explained that glycol dehydrator flash tank exhaust gas is directed to the reboiler combustion unit or to the thermal oxidizer for destruction, in compliance with this condition.

V.1, VI.6: As required by S.C. VI.6, the facility keeps records of wet gas composition determined through required annual wet gas analysis. Amy provided the analytical results from the tests performed on February 13, 2023 and January 19, 2024. The results include analysis for nitrogen, carbon dioxide, hydrogen sulfide, C1-C6 series hydrocarbons, benzene, toluene, xylene, ethylbenzene, and heptanes plus, as required by S.C. V.1.

VI.8: In accordance with this condition, Amy provided records for maintenance, tune-ups, and testing done on the reboiler burner for EUDEHY3. The provided record indicates these actions were performed on December 18, 2020. The unit is due for the next tune-up in 2025.

EUAUXGEN2-7

This is a natural gas-fired emergency generator subject to 40 CFR 63 Subpart ZZZZ. I observed this unit during my inspection and observed that the nameplate listed a rating of 1084 HP which is consistent with the description in the ROP.

III.1, VI.1, VI.2, IX.1: Amy provided a copy of the emergency generator use log which indicates the reason for operation and amount of time in operation in compliance with VI.1 and VI.2. During the inspection, I observed the non-resettable hour meter and it read 675 hours. The log shows that between November 2022 and July 2024, the generator operated for a total of 36.93 hours; of this time, 25.40 hours were for emergency use. This is below both the 50 hours (for non-emergency) and 100 hours (for maintenance and testing) per year limits set by 40 CFR 63 Subpart ZZZZ, indicating compliance with the rule. During the pre-inspection meeting, I reviewed 2023 inspection/maintenance records for the unit.

EUEMERGGEN3

As described in the permit, this is a natural gas-fired RICE emergency generator with Lo-NOx combustion technology and a maximum rated heat input of 12.25 MMBtu/hr. I observed this unit during my inspection and observed a rating of 1818 HP on the nameplate, which matches the description in the ROP.

I.1-I.5, V.1, V.2, VI.2, VII.4, IX.1: The facility provided records from the initial emissions compliance demonstration performed on March 28, 2014 (per S.C. V.1) and the most recent report for the compliance test performed on September 7, 2023 (per S.C. V.2). I reviewed maintenance records in accordance with S.C. VI.2 during the pre-inspection meeting.

S.C. I.1 sets a NOx emission limit of 0.5 g/HP-hr; I.3 sets a NOx emission limit of 2.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2023 compliance test showed an average NOx emission rate of 0.5 g/HP-hr, in compliance with both limits. Subpart JJJJ also sets a limit of 160 ppmvd at 15% O₂, and the results showed a NOx emission rate of 36 ppmvd in compliance with this limit.

S.C. I.2 sets a VOC emission limit of 0.81 g/HP-hr; I.5 sets a VOC emission limit of 1.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2023 compliance test showed an average VOC emission rate of 0.55 g/HP-hr, in compliance with both limits. Subpart JJJJ also sets a limit of 86 ppmvd at 15% O₂, and the results showed a VOC emission rate of 44 ppmvd in compliance with this limit.

S.C. I.4 sets a CO emission limit of 4.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2023 compliance test showed a CO emission rate of 2.1 g/HP-hr, in compliance with this condition. Subpart JJJJ also sets a limit of 540 ppmvd at 15% O₂, and the results showed a CO emission rate of 269 ppmvd in compliance with this limit.

III.1, III.4, VI.1, IX.1, IX.2: S.C. III.1 sets a limit of 500 hours of operation per 12-month rolling time period as determined at the end of each calendar month. Amy provided records for monthly and 12-month rolling hours of operation of EUEMERGGEN3, in compliance with S.C. VI.1. The generator log provided indicates the date of operation, the reason for operation (including emergency or non-emergency use), and the total time of operation. From November 2022 through July 2024, the highest 12-month rolling

hours of operation was 120 hours as calculated in July 2023 and indicates compliance with S.C. III.1. During this time period, the generator operated for 80 emergency hours and 20.2 non-emergency hours. This is below the 50 hours (for non-emergency) and 100 hours (for maintenance and testing) per year limits set by 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart JJJJ, and listed in S.C. III.4.

III.2, VI.3: During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the generator in compliance with S.C. III.2. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.3, the facility is meeting the requirements for these conditions.

III.3: In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for EUEMERGGEN3. This plan includes equipment covered by the PM/MAP, engine operation procedures, malfunction event procedures, a maintenance schedule, and record retention procedures. During the pre-inspection meeting, I observed records for monthly and 6-month inspection and maintenance for the unit. A monthly maintenance plan included action items such as performing an oil sample, inspecting belts/hoses, and inspecting spark plugs. Consumers staff explained that some maintenance procedures are based on hours of operation for the unit which is consistent with the description in the PM/MAP. The facility also maintains an hours of operation log in accordance with the PM/MAP. Based on the records reviewed and observations during the inspection, the facility is operating in compliance with its PM/MAP.

IV.1: During the facility walkthrough, I observed a non-resettable hour meter on the generator. I observed a reading of 359 hours.

EUBOILER3

This natural gas-fired boiler is rated at a maximum heat input of 12.25 MMBtu/hr, according to the permit, and is used for building heat and hot water according to Consumers staff. I observed this unit during the inspection and the nameplate read a maximum gas firing rate of 11,694,000 Btu/hr, which is consistent with the maximum heat input listed in the ROP.

I.1, I.2, V.1: These conditions set a NO_x emission limit of 0.43 lb/hr and a VOC emission limit of 0.05 lb/hr. Testing for verification of these emission rates has not been requested by the AQD per S.C. V.1. Recordkeeping condition VI.5, discussed below, is used to evaluate compliance with S.C. I.1. Recordkeeping condition VI.6, also discussed below, is used to verify compliance with S.C. I.1 and I.2. These records indicate that the facility is in compliance with the emission limits.

III.1, VI.3: During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the boiler in compliance with S.C. III.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.3, the facility is meeting the requirements for these conditions.

III.2: In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 heating boiler. This plan includes equipment covered by the PM/MAP, boiler operating variables to be monitored, boiler malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP. Parameters that are monitored include the combustion flame, combustion air pressure, fuel pressure, and water bath temperature; alarms or automatic shutdown systems are in place if these parameters are outside of normal operating ranges. I reviewed tune-up and inspection records consistent with the PM/MAP during the pre-inspection meeting, and the records listed action items including burner inspection, air-to-fuel control inspection, flame pattern inspection, and CO/O₂ level inspection. Based on the records reviewed and observations during the inspection, the facility is operating in accordance with the PM/MAP.

IV.1, VI.2, VI.4, IX.1: The facility maintains a device to monitor and record the natural gas usage for EUBOILER3 on a monthly basis in compliance with S.C. IV.1, and Amy provided gas usage records in

compliance with S.C. VI.2 (and underlying rules 40 CFR 60 Subparts A and Dc) and VI.4. The records show that from November 2022 through July 2024, the highest EUBOILER3 fuel use was 1,238.64 MSCF in December 2022. The highest 12-month rolling fuel use in this period was 12,901.33 MSCF as calculated in the same month. I was unable to locate the gas usage monitor during the inspection.

IV.2, VI.5: During the pre-inspection meeting, Consumers staff confirmed that EUBOILER3 is equipped with a low NOx burner in compliance with S.C. IV.2. Amy provided a vendor data sheet for the boiler which states that “the low NOx burner is capable of meeting EPA testing for an emission limit of 0.035 lb NOx/MMBtu,” indicating compliance with S.C. VI.5.

VI.6: During the pre-inspection meeting, I reviewed records required by S.C. VI.6 for maintenance, tune-ups, and testing performed on the boiler. The records show that these annual maintenance/tune-up was performed in December 2023. The annual maintenance/tune-up/testing before this was performed in November 2022, and the facility is scheduled to perform this again in the late fall of 2024.

FGENGINES3

Per the description in the ROP, these are five natural gas fired, spark ignition, four-stroke lean burn, reciprocating internal combustion engines that drive compressors to compress natural gas for transportation between the storage field and pipeline system; each has a maximum rated heat input of 32 MMBtu/hr and rated output of 4,735 horsepower. I observed these units during the inspection and observed a rating of 4735 HP on the nameplate of EUENGINE31, which is consistent with the ROP.

I.1-I.7, IV.1, V.6, VI.11: In accordance with recordkeeping requirement S.C. VI.11, Amy provided a copy of the most recent results for emissions testing required by S.C. V.6 for evaluation of compliance with ROP emission limits (S.C. I.1-I.7), 40 CFR Part 63, Subpart ZZZZ, and 40 CFR Part 60, Subpart JJJJ. This testing was performed on August 29-September 1, 2023.

S.C. I.1, I.2, and I.4 establish the following limits:

NOx: 0.5 g/HP-hr

CO: 0.2 g/HP-hr

VOC: 0.19 g/HP-hr

S.C. I.5-I.7 and 40 CFR 60 JJJJ establish the following limits:

NOx: 1.0 g/HP-hr

CO: 2.0 g/HP-hr

VOC: 0.7 g/HP-hr

S.C. I.3, IV.1.a, IV.1.b, and 40 CFR 63 ZZZZ establish the following requirements:

≥93% CO reduction at 15% O₂

Catalyst pressure drop change: less than 2 inches from initial

Catalyst inlet temperature (°F): 450-1350

Below are the results for each engine:

EUENGINE3-1:

NOx: 0.5 g/HP-hr

CO: 0.1 g/HP-hr

VOC: 0.1 g/HP-hr

96.6% CO reduction

Catalyst pressure drop change: 0.1 inches

Catalyst inlet temperature: 863°F

EUENGINE3-2:

NOx: 0.4 g/HP-hr

CO: 0.04 g/HP-hr

VOC: 0.03 g/HP-hr

98.2% CO reduction

Catalyst pressure drop change: 0.3 inches

Catalyst inlet temperature: 869°F

EUENGINE3-3:

NOx: 0.4 g/HP-hr

CO: 0.04 g/HP-hr

VOC: 0.04 g/HP-hr

97.9% CO reduction

Catalyst pressure drop change: 1.0 inch

Catalyst inlet temperature: 816°F

EUENGINE3-4:

NOx: 0.3 g/HP-hr

CO: 0.1 g/HP-hr

VOC: 0.03 g/HP-hr

96.4% CO reduction

Catalyst pressure drop change: 0.7 inches

Catalyst inlet temperature: 823°F

EUENGINE3-5:

NOx: 0.4 g/HP-hr

CO: 0.1 g/HP-hr

VOC: 0.02 g/HP-hr

96.0% CO reduction

Catalyst pressure drop change: 0.1 inches

Catalyst inlet temperature: 801°F

The results indicate compliance with the above conditions.

II.1, VI.12: During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in FGENGINE3 in compliance with S.C. II.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.12, the facility is meeting the requirements for these conditions.

III.3, VI.8: In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 compressor engines. This plan includes equipment covered by the PM/MAP, engine and oxidation catalyst operating variables to be monitored, engine and oxidation catalyst malfunction event procedures, emission check procedures, an oxidation catalyst maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP. The Electronic Control Module (ECM) monitors the operating parameters of each engine; the Integrated Combustion Sensing Module (ICSM) monitors the temperature of the cylinder exhaust ports, the inlets of the turbocharger turbine, the outlets of turbocharger turbines, and the combustion sensors. Both monitoring systems are equipped with automatic shutdown if operating parameters are outside of acceptable ranges. The pressure drop across the catalyst and catalyst inlet temperature is also monitored and recorded in accordance with the PM/MAP. During the pre-inspection meeting, I reviewed records required by S.C. VI.8 for maintenance and inspections performed on all engines in 2023. Consumers staff also showed me descriptions of inspection procedures based on hours of operation (1000 hrs, 2000 hrs, etc.). Based on the records provided and observations during the inspection, the facility is operating in accordance with the PM/MAP.

III.5, VI.1, IX.1: S.C. VI.1 requires the permittee to maintain a continuous parameter monitoring system (CPMS) for each stationary RICE in FGENGINE3. S.C. III.5 requires a site-specific monitoring plan that addresses oxidation catalyst parameter monitoring system design, data collection, and quality assurance. Amy provided a copy of this plan for the CPMS associated with FGENGINE3. The plan includes sections discussing design specifications for monitoring system equipment, catalyst temperature measurement locations, the data acquisition system, periodic quality assurance/quality control procedures, recordkeeping and reporting procedures, and a program of corrective action for a

malfunctioning CPMS. Calibrations for the CPMS temperature monitoring sensors are performed according to manufacturer recommendations, and I reviewed records for this calibration performed in December 2023 for FGENGINE3. Since November 2022, the facility has not reported any CPMS downtime or deviations. Based on the information provided, the facility is operating in accordance with the CPMS monitoring plan.

IV.2, VI.2, VI.3, VI.5, VI.6, VI.7: In compliance with these conditions, the CPMS collects oxidation catalyst temperature data at least once every 15 minutes, and the facility maintains records for 4-hour rolling average catalyst inlet temperature. Amy provided records for the 4-hour rolling catalyst temperature data recorded every 15 minutes for each engine. For operation between November 2022 and July 2024, the data indicates the following for each engine:

EUENGINE31 - lowest 4-hr rolling catalyst inlet temperature was 674°F; highest was 881°F
EUENGINE32 - lowest 4-hr rolling catalyst inlet temperature was 817°F; highest was 903°F
EUENGINE33 - lowest 4-hr rolling catalyst inlet temperature was 760°F; highest was 839°F
EUENGINE34 - lowest 4-hr rolling catalyst inlet temperature was 742°F; highest was 860°F
EUENGINE35 - lowest 4-hr rolling catalyst inlet temperature was 710°F; highest was 1130°F

All the above values are between the noted range of 450°F and 1350°F noted in S.C. IV.2.

The facility also records the pressure drop across the catalyst continuously. The permit requires only monthly readings. Amy provided records which indicate that for operation between November 2022 and July 2024, the pressure drop across the catalyst for each engine is within 2 inches of the value measured during the initial compliance test.

In compliance with S.C. VI.6, the facility has provided compliance notifications and reports for 40 CFR Part 60, Subpart JJJJ, and 40 CFR Part 63, Subpart ZZZZ. As discussed above, I reviewed 2023 maintenance records for the annual CPMS catalyst transducer calibration for each engine. Amy confirmed that these annual calibrations include accuracy audits which ensure that the temperature monitors meet the requirements in 40 CFR 63.6625(b)(4).

VI.9: Amy provided monthly fuel use records for each engine from November 2022 through July 2024 in compliance with this condition. The record shows that the highest monthly fuel use in Engine 3-1 was 8,879 MCF in July 2024; for Engine 3-2 it was 13,983 MCF in August 2023; for Engine 3-3 it was 18,726 MCF in August 2023; for Engine 3-4 it was 19,580 MCF in September 2023; for Engine 3-5 it was 18,509 MCF in August 2023.

VI.10: I asked Amy to provide records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b) as required by this condition. She reported that no malfunctions have occurred between November 2022 and July 2024.

FGGLYCDEHYDS

Glycol dehydrators are used to remove hydrocarbons and moisture that the natural gas absorbs while underground. The saturated glycol that comes out of the dehydrators goes to a 3-phase separator with a flash tank to remove entrained gas and hydrocarbon liquid, then through filters, and the resulting lean glycol is recirculated back to the glycol contact towers. Emissions from the flash tank are directed to a thermal oxidizer or reboiler.

This flexible group is associated with EUGLYCDEHYD01 and EUGLYDEHYD02. I observed these units and associated thermal oxidizers during my inspection. I observed control panels with temperature monitors for each unit, but the monitors did not display temperature readings since gas was not being processed during my visit and the units were not operating.

I.1-I.3, V.1-V.4, VI.1: In compliance with S.C. VI.1, Amy provided annual VOC and benzene emission calculations for each glycol dehydration unit process, based on a 12-month rolling period. In accordance with S.C. V.1-V.4, the facility conducts an analysis of the wet gas stream annually to determine the composition of the gas processed through the glycol dehydration units. GRI-GLYCalc software is used, with most recent wet gas analysis data as inputs, to calculate VOC and benzene emission factors.

The records provided show that from November 2022 through July 2024, Plant 1 operated February through April 2023 and January through February 2024. Plant 2 operated December 2023 through January 2024 and March 2024. In this time period, the highest monthly VOC emissions for EUGLYCDEHYD01 and EUGLYCDEHYD02 combined was 0.0079 tons in March 2023. The highest 12-month rolling VOC emissions for the two units combined was 0.0661 tpy as calculated in November and December 2022. This is below the 12.0 tpy limit specified in S.C. I.2.

The highest GRI-GLYCalc VOC emission factor for EUGLYCDEHYD01 was 0.0547 lbs/hr, calculated in April 2023. Using this value to calculate a daily VOC emission factor, assuming operation for 24 hours, gives a value of 1.31 lbs/day. For EUGLYCDEHYD02, the highest emission factor was 0.0569 lbs/hr, calculated in December 2023, and gives a daily emission factor of 1.37 lbs/day. Combining these two daily emission factors gives a combined VOC emission factor of 2.68 lbs/day, which is below the 71.0 lbs/day limit specified by S.C. I.1 for both units combined.

The highest monthly benzene emissions for EUGLYCDEHYD01 were 0.0005 tons in March 2023, and the highest 12-month rolling emissions were 0.0028 Mg/year as calculated in November and December 2022. This is below the 0.90 Mg/year limit specified in S.C. I.3.

The highest monthly benzene emissions for EUGLYCDEHYD02 were 0.0000002 tons in December 2023, and the highest 12-month rolling emissions were 0.0018 Mg/year as calculated in November and December 2022. This is below the 0.90 Mg/year limit specified in S.C. I.3.

The 2024 wet gas analysis did not detect benzene in the gas sample and 2024 benzene emissions are consequently calculated as zero in GRI-GLYCalc.

III.1: During the inspection, Consumers staff confirmed that stripping gas is not used in the glycol regenerator stills in compliance with this condition.

IV.1-IV.4, VI.3: These conditions require that the glycol dehydration units are not operated unless the thermal oxidizers are maintained and operated in a satisfactory manner, which is defined by maintaining a daily average minimum combustion chamber temperature of 1400°F and a minimum retention time of 0.5 seconds (IV.3). In accordance with S.C. IV.2, the facility operates a device to monitor and record the combustion chamber temperature for each thermal oxidizer every 15 minutes. During the inspection, I reviewed calibration records for these monitoring devices for 2023 for both dehydration units. As discussed under EUDEHY3 S.C. IV.1, flash tank off-gas is burned in the glycol dehydration reboiler combustion units or thermal oxidizer, in compliance with S.C. IV.4.

Amy provided continuous monitoring records in accordance with S.C. VI.3 for thermal oxidizer combustion chamber temperature for each glycol dehydration unit. Based on the 15-minute data for period of operation from November 2022 through July 2024, the units were operated above the 1400°F minimum combustion chamber temperature as required by S.C. IV.3. Compliance with the minimum operating temperature is further discussed in section FGDEHYHHH.

VI.2: This condition requires that the facility maintain records of annual natural gas throughput to meet underlying requirements of 40 CFR Part 63, Subpart HHH. Amy provided a memorandum dated December 15, 2005, which explains that 40 CFR 60.1270(a) allows the use of facility design maximum natural gas throughput as an alternative to 40 CFR 60.1270(a)(1) and (2), and that previous permit to install documents show that Ray Compressor is limited in volume to 40.0 billion cubic feet of working gas cyclic capacity.

FGDEHYHHH

40 CFR Part 63 Subpart HHH applies to natural gas transmission and storage facilities that are major sources of HAP emissions, and affected sources include glycol dehydration units. The conditions of this flexible group apply to EUGLYCDEHYD01, EUGLYCDEHYD02, and EUDEHY3.

I.1, III.3, IV.2, V.2: The facility is required to operate thermal oxidizers at or above a minimum temperature determined during testing required by S.C. V.2 for compliance with BTEX emission limits.

Amy provided a copy of results for the most recent BTEX tests performed in December 2019 for EUDEHY3 and January 2020 for EUGLYCDEHYD01 and EUGLYCDEHYD02. The following are the BTEX concentrations, emissions, and minimum combustion chamber temperature for each glycol dehydrator control:

EUGLYCDEHYD01:

BTEX Compound Concentrations (ppmv): < 0.07

BTEX Emission Rate (Mg/year): < 0.01

BTEX Emission Limit (Mg/year): 2.1

Minimum Combustion Chamber Temperature (°F): 1553

EUGLYCDEHYD02:

BTEX Compound Concentrations (ppmv): < 0.06

BTEX Emission Rate (Mg/year): < 0.01

BTEX Emission Limit (Mg/year): 1.8

Minimum Combustion Chamber Temperature (°F): 1538

EUDEHY3:

BTEX Compound Concentrations (ppmv): < 0.06

BTEX Emission Rate (Mg/year): < 0.02

BTEX Emission Limit (Mg/year): 1.9

Minimum Combustion Chamber Temperature (°F): 1530

As discussed previously, 15-minute data for combustion chamber temperature during periods of operation indicate that all three units operate above 1400°F as required by S.C. V.2.

III.2-III.3, IV.3-IV.4, VI.3: Per S.C. III.3, the facility is required to operate the thermal oxidizers at the unit-specific minimum temperatures noted above, based on daily average temperatures (S.C. III.2), to be considered in compliance with thermal oxidizer performance requirements. The facility is required to continuously monitor and record the temperature on the thermal oxidizers (IV.3-IV.4) and calculate the daily average temperature. In accordance with S.C. VI.3, Amy provided TO combustion chamber temperature records for Plants 1, 2, and 3, including continuous monitoring records (recorded every 15 minutes) and daily average temperature calculations for periods when the glycol dehydration units were operating from November 2022 through July 2024.

The data for all three dehydration units indicates that the facility operated the thermal oxidizers in accordance with performance requirements. Daily average temperatures were above the minimum temperatures established during testing.

III.4, VI.5, VI.18: Amy provided a copy of the site-specific monitoring/quality control plan for the CPMS associated with the glycol dehydrators on site. As required by the condition, the plan includes descriptions and design specifications for CPMS equipment, monitoring and quality assurance/quality control procedures, CPMS operation and maintenance procedures, data management procedures, and CPMS malfunction procedures. Amy provided records for CPMS maintenance operation, including work orders for maintenance on dehydration unit equipment and thermal oxidizer calibration. As previously discussed, the CPMS continuously monitors and records TO combustion chamber temperature, and it is equipped with alarms and automatic shutdown if the temperature is nearing or outside of acceptable operating range.

During the inspection, I reviewed maintenance records for all three dehydration units, including annual TO temperature monitor calibrations that were performed in September 2023 for all three units. Amy confirmed that these annual calibrations include accuracy audits which ensure that the temperature monitors meet the requirements in 40 CFR 63.1283(d)(3)(i)(A). Based on the records reviewed and observations during the inspection, the facility is operating in accordance with its CPMS monitoring/quality control plan. Since November 2022, the facility has reported no CPMS downtime or deviations.

IV.1, V.1, VI.7-VI.13: S.C. IV.1 requires that process vents are connected to control devices through a closed vent system, which should be operated with no detectable emissions. S.C. VI.7-VI.13 specify inspection requirements for each closed-vent system, except for parts that are designated as unsafe or difficult to inspect. According to Amy, no parts are designated as unsafe or difficult to inspect. Amy provided a copy of the work order for the annual "no detectable emissions" inspection required by S.C. V.1 that was performed on March 20, 2023. The report showed that leaks were not detected for any components for the glycol dehydrators. According to Amy, the 2024 testing is scheduled for November since inspections are scheduled based on when the units are restarted.

VI.1: In accordance with this condition, Amy provided a log for November 2022 through July 2024 showing the flow rate of natural gas, in million standard cubic feet per day (MMscfd), to each glycol dehydration unit on each day of processing gas.

VI.2, IX.1: S.C. VI.2 requires the permittee to maintain records of the annual facility natural gas throughput. As discussed under FGGLYCDEHYDS VI.2, and per S.C. IX.1, the facility uses the design maximum natural gas throughput to estimate the maximum potential emissions as an alternative to calculating the annual maximum natural gas throughput.

VI.21: The facility is required to maintain records of occurrence and duration of each malfunction of process equipment, pollution control equipment, and monitoring equipment. Based on the facility's reporting, these records are maintained and no malfunctions have been reported.

FGPIPEHEATERS3

This flexible group applies to EUPIPEHEATER31 and EUPIPEHEATER32, which are natural gas-fired pipeline heaters equipped with low NOx burners and rated at maximum heat input of 18 MMBTU/hr, each. I observed these units during my inspection but could not locate nameplates to verify if the nameplates match the descriptions in the ROP.

I.1, I.2, V.1: S.C. I.1 and I.2 specify NOx and VOC emission limits of 0.9 lb/hr for each pollutant. The AQD has not requested testing per S.C. V.1 to verify compliance with these emission rates. Recordkeeping condition VI.6, discussed below, is used to verify compliance with S.C. I.1. Recordkeeping condition VI.7, also discussed below, is used to verify compliance with S.C. I.2. Based on the records provided, the facility is in compliance with the emission limits.

III.1, VI.4: During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the pipe heaters in compliance with S.C. III.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that "gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet." Based on this record provided in accordance with S.C. VI.4, the facility is meeting the requirements for these conditions.

III.2: In accordance with this condition, Amy provided a copy of the PM/MAP for the Plant 3 line heaters. This plan includes equipment covered by the PM/MAP, operating variables to be monitored, malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP. Each heater control system monitors parameters including water bath temperature, combustion flame, fuel pressure, and exhaust gas temperature. The system is equipped with alarms and automatic shutdown if readings are outside of ranges for proper operation. During the inspection, I reviewed work orders for inspection/maintenance associated with the line heaters. Based on the records reviewed and observations during the inspection, the facility is operating in accordance with the PM/MAP.

IV.1, VI.1, VI.3, VI.5: The facility is required by these conditions and 40 CFR Part 60 Subparts A and Dc to maintain a device to monitor and record the monthly natural gas usage for EUPIPEHEATER31 and EUPIPEHEATER32. I did not observe this device during my walkthrough. In accordance with these conditions, Amy provided a record of the monthly and 12-month rolling fuel use for the pipe heaters individually and combined. The highest monthly fuel use in FGPIPEHEATERS from November 2022 through July 2024 was 8454.2 MCF in February 2023.

VI.6: Amy provided a copy of the manufacturer's guarantee for the pipe heaters to demonstrate that each low-NOx burner is designed to emit no more than 0.05 lb NOx per million Btu of heat input, in accordance with this condition. The manufacturer is GasTech Engineering, LLC according to this document.

VI.7: During the inspection, I reviewed tune-up records for both units for 2022, 2023, and 2024. The tune-ups have been performed annually.

FGBLRMACT

The conditions of this flexible group apply to EUPIPEHEATER31, EUPIPEHEATER32, and EUBOILER3.

III.2, VI.1: Amy provided notification records submitted for compliance with 40 CFR 63 Subpart DDDDD. The annual compliance report for January 1, 2022 through December 31, 2022 shows that annual tune-ups required by S.C. III.2 were done on October 25, 2022 for EUBOILER3, and on November 14, 2022 for EUPIPEHEATER31 and EUPIPEHEATER32. 2023 tune-ups were performed on December 5 for EUBOILER3 and November 20 for EUPIPEHEATER31. The tune-up for EUPIPEHEATER32 was performed on February 16, 2024 because the unit was not operating on the required date for the tune-up, and the tune-up was conducted within 30 days of startup.

VI.2. I asked Amy to provide records for the hours per calendar year that alternative fuel was burned and total hours per calendar year that units operated during periods of curtailment or gas supply emergencies. According to Amy, none of these situations occurred.

FGBLRMACTSMALL

The conditions of this flexible group apply to new and existing boilers and process heaters with a heat input capacity of < 10 MMBtu/hr. I observed EUPIPEHTR1, EUPIPEHTR2, EUPIPEHTR3, and EUPIPEHTR4 during my inspection, which were identical and read a maximum heat input of 6 MMBtu/hr on the nameplates. This is consistent with the description in the ROP.

III.4-III.5, VI.1: Amy provided notification records for compliance with 40 CFR 63 Subpart DDDDD. The biennial compliance report for January 1, 2022 through December 31, 2023 says that EUPIPEHTR1 and EUPIPEHTR2 were tuned up on March 8, 2022; EUPIPEHTR3 and EUPIPEHTR4 were tuned up on March 9, 2022. EUPIPEHTR1 and EUPIPEHTR2 were tuned up on January 3, 2024; EUPIPEHTR3 and EUPIPEHTR4 were tuned up on January 2, 2024 according to information provided by Amy. These units are in compliance for tune ups once in a two-year period for units rated between 5 and 10 MMBtu/hr.

For boilers and heaters rated less than 5 MMBtu/hr requiring tune-ups once every 5 years, Amy provided the following dates of the two most recent tune-ups:

EUFGHEATER: 10/20/2020, 12/15/2015
 EUFGHTR-P1: 10/21/2020, NA (installed in 2019)
 EUAUXBLR2-7: 12/08/2020, 12/03/2015
 EUDEHYBLR1: 12/14/2020, NA (revised applicability in 2019)
 EUDEHYBLR2: 12/14/2020, NA (revised applicability in 2019)
 EUDEHY3REBLR: 12/18/2020, NA (revised applicability in 2019)

The facility has been submitting reporting required under section VII for these heaters.

FGCOLDCLEANERS

III.2, IV.1-IV.3, VI.2, VI.3: Amy provided records in accordance with S.C. VI.2 that list information for the cold cleaners at the facility. I observed one cold cleaner during the facility walkthrough and observed that a lid covered it in compliance with S.C. IV.3. The air/vapor interface was less than 10 square feet in accordance with S.C. IV.1, and instructions for use were posted in accordance with S.C. VI.3. The cleaner also had a device for draining cleaned parts in accordance with S.C. IV.2. Consumers staff informed us that maintenance is performed monthly in accordance with S.C. III.2. The cleaner is not heated.

II.1, IV.4-IV.5: Amy provided the SDS for the solvent used, which is Zep Dyna 143. This solvent has a Reid Vapor Pressure of 0.0077 psia, which is less than less than 0.3 psia and consequently the cleaner is not required to be mechanically assisted per S.C. IV.4. The VOC content of the solvent is 6.59 lbs/gallon.

FGRULE285(2)(mm)

Since November 2022, the AQD has not received any release reports for releases of natural gas greater than 1,000,000 standard cubic feet. During the inspection, Consumers staff confirmed that no releases had occurred. The facility is in compliance with the requirements of this flexible group and R 336.1285 (mm).

FGTANKS3

This flexible group is associated with seven above-ground storage tanks. There are no requirements applicable to this flexible group. According to the PTI evaluation document, emissions from these tanks using worst case inputs were determined using the USEPA TANKS program and indicated that the combined VOC emissions will be less than 10 pounds per year. The top-down BACT analysis demonstrated that no control is BACT for these storage tanks.

Reporting

The facility submits semiannual and annual compliance certification reports as required by the ROP.

Overall, the facility is in compliance with all evaluated rules and regulations.

NAME Noshin Khan

DATE 10/01/2024

SUPERVISOR K. Kelly